REMARKS/ARGUMENTS

In response to the Office Action dated October 14, 2005, Claims 1 through 24 remain in this application. Claim 1 has been amended.

Claims 1-24 were rejected under 35 USC 103(a).

Claims 1-24 were rejected under obviousness-type double patenting.

The Invention

The invention concerns the applicants' discovery of inefficiencies inherent in plasma immersion ion implantation due to build-up of resistive capacitive effects, and the solution to this problem by introducing an RF bias onto the wafer (as discussed in applicants' specification at page 78 lines 6-10 and page 79 lines 3-16). Applicants have discovered such an RF bias not only eliminates the problem of inefficient plasma immersion ion implantation but also provides a way of precisely controlling ion implantation depth (without having to alter other process parameters). These discoveries together provide a revolutionary advance in the art.

Claim Rejections - 35 USC § 103

First Rejection: Claims 1-4 and 6-24 are rejected under 35 USC 102(a) as being unpatentable over Henley et al. (US Pat. No. 6,321,134) in view of Ishii et al. (US Pat. No. 5,571,366). Henley represents the conventional state of the art, in which there is no RF bias. Moreover Henley fails to disclose a gas distribution system containing a gas form or compound of the species to be implanted. Finally, Henley fails to disclose the symmetrical inductively coupled power applicator of the invention, Henley employing instead plural inductors whose axes

of symmetry do not coincide with the axis of the workpiece support pedestal.

The rejection relies upon Ishii to fill in the elements missing from Henley. However, Ishii has nothing to do with ion implantation, but is concerned with plasma etch processes. Such etch processes employ an RF bias for a purpose (not particularly described in Ishii) having nothing to do with plasma immersion ion implantation, specifically to adjust well known etch process performance parameters in the well-known manner. Such parameters are related to such issues as etch rate, etch micro-loading, etch selectivity and so forth, and have nothing whatsoever to do with ion implantation efficiency or ion implantation depth. There is nothing in Ishii that is relevant to plasma immersion ion implantation, and therefore there is nothing in Ishii that would suggest that Henley requires any improving or could be improved by introducing features from Ishii into Henley. So far as the prior art is concerned, Henley works perfectly well, and there is no concern regarding Henley's efficiency and there is no concern about how to control ion implant depth in Henley. Nothing in Ishii would provide the slightest motivation to modify Henley. Such motivation can only arise with hindsight of the present applicants' discoveries that RF bias can be used for independent control of ion implant depth and that RF bias dramatically improves plasma immersion ion implantation efficiency.

It is felt therefore that the rejection does not establish any motivation for the following elements of Claim 1:

(a) ". . . an RF bias generator having an RF bias frequency and coupled to said workpiece support pedestal . . ."

(b) ". . . for applying an RF bias <u>corresponding to said desired implant depth</u> to said workpiece . . ."

As for element (a), it is unobvious to solve the implantation inefficiency problems discovered by the present applicants by applying an RF bias. The cited references demonstrate a complete

unawareness of the problem, and a complete lack of any relationship between Henley and Ishii. Therefore, there can be no justification for any combination of Ishii with Henley. As for element (b), it is unobvious to correlate the RF bias with the desired implant depth, because such control was unknown prior to the invention. Ishii makes no mention of an implant depth.

Claims 2-4 and 6-24 depend from Claim 1 and are therefore patentable upon the same basis. Therefore, reconsideration of the rejection of Claims 1-4 and 6-24 is respectfully requested based upon the claim language quoted above.

Second Rejection: Claim 5 is rejected under 35 USC 103(a) as being unpatentable over Henley et al. in view of Ishii et al. and further in view of Miller et al. (US Pat. No. 6,643,557).

Miller has no relevance to the claim language quoted above. Claim 5 depends from Claim 1 and his therefore patentable upon the same basis. Therefore, reconsideration of the rejection of Claim 5 is respectfully requested.

Double Patenting

Claims 1-24 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-4, 52-58, 70, 73, 74, 79, and 81-83 of co-pending Application Serial No. 10/646,467.

Applicants hereby submit a Terminal Disclaimer to obviate the double patenting rejection over U.S. Application Serial No. 10/646,467.

Claims 1-24 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-8 and 31-33 of co-pending Application Serial No. 10/646,528.

Applicants hereby submit a Terminal Disclaimer to obviate the double patenting rejection over U.S. Application Serial No. 10/646,528.

SUMMARY

In view of the foregoing corrections and remarks, it is felt that the rejection of the claims under 35 USC 103(a) and obviousness-type double patenting rejections have been overcome. Therefore, withdrawal of these rejections is respectfully requested and allowance of the application is earnestly solicited.

If, However, the Examiner believes that there are any unresolved issues requiring adverse final action in any of the claims now pending in the application, the Examiner should telephone Robert Wallace at (805) 644-4035 so that appropriate arrangements can be made for resolving such issues as expeditiously as possible.

Respectfully submitted,

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